

RESIDUE DETECTION FOR REAL-TIME REMOVAL OF PAINT FROM METALLIC SURFACES

Yoseph Bar-Cohen, Xiaoqi Bao, Benjamin Dolgin, Neville Marzwell
JPL/Caltech, (MC 82-105), 4800 Oak Grove Drive, Pasadena, CA 91109-8099, Phone 818-354-2610, Fax 818-393-3254, yosi@jpl.nasa.gov web: <http://ndea.jpl.nasa.gov>

Paint stripping from large steel ships and other metallic surfaces is a major issue in the maintenance and refurbishing of structures, and environmental concerns are greatly limiting the possible options. As a result, waterjet with water recycling has become the leading form of paint stripping and robotic manipulators with scanning bridges were constructed by various manufacturers to address this need. The application of such bridges is slow and their access is constrained by the complex shape of the ship hull and various features on the surface. To overcome these limitations, robotic system that is called UltraStrip is developed. This system uses magnetic wheels to attach the stripper to the structure and travel on it while performing paint stripping. To assure efficient paint stripping feedback data is required to control the travel speed by monitoring the paint thickness before and during the stripping process. Efforts at JPL are currently underway to develop the required feedback capability to assure effective paint stripping. Various possible electromagnetic sensors were considered and issues that can affect the sensitivity, reliability and applicability of the sensors are being investigated with emphasis on measuring the initial conditions of the paint. Issues that affect the sensory data in dynamic conditions are addressed while providing real-time real feedback for the control of the paint stripper speed of travel.